

# The Impact of Customer Concentration on the Efficiency of Corporate Innovation

## -- Based on the Nature of Property Rights and the Heterogeneity of High Technology

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### Abstract

Using data related to customer concentration of Chinese A-share listed companies from 2005-2021, the article investigates the mechanism of the role of customer concentration as well as does heterogeneity analysis on the nature of property rights and the level of corporate high technology, respectively. The empirical tests show that higher customer concentration reduces the innovation efficiency of firms. Further analysis based on the nature of property rights and high-tech level also finds that the negative effect of customer concentration on innovation efficiency is more significant when the nature of enterprises is state-owned enterprises and high-tech enterprises. This paper provides different perspectives on the impact of customer concentration on enterprise innovation and also expands the research on enterprise innovation efficiency.

### Keywords

Customer Concentration; Innovation Efficiency; Nature of Property Rights; High Technology Enterprises.

### 1. Introduction

Science and technology innovation is essential in the development process of Chinese enterprises. General Secretary Xi Jinping pointed out in the report of the 19th Party Congress that innovation is the first driving force leading development and a strategic support for building a modern economic system. In the in-depth implementation of the spirit of the 19th Party Congress, innovation efficiency has increasingly become a concern for Chinese enterprises to implement innovation development. On May 28, 2021, General Secretary Xi Jinping emphasized "giving full play to the leading role of scientific and technological innovation" in his speech at the 20th Congress of the Chinese Academy of Sciences, the 15th Congress of the Chinese Academy of Engineering and the 10th National Congress of the Chinese Association for Science and Technology. More and more companies are paying attention to the development of innovation, and how to improve the level of innovation is an essential and urgent consideration[1]. According to the "National Science and Technology Investment Statistics Bulletin 2020" published by the National Bureau of Statistics, the expenditure on research and experimental development (R&D) of all kinds of enterprises is 186.38 billion yuan, an increase of 10.4% over the previous year, and the proportion of enterprise expenditure is 76.6%, an increase of 0.2% compared with 2019, enterprises have taken the leading role in the field of science and technology innovation in China. According to the Global Innovation Index GII Ranking Report 2021 released by the World Intellectual Property Organization, China's innovation index ranking is at the 12th place in the world, indicating that there is still much room for improvement in China's innovation level, and there is still a certain distance from developed countries.

Customers are crucial to the overall development of an enterprise, and the degree of reliance on large customers can reflect the customer concentration of an enterprise. In recent years, the academic community has explored the issue of customer concentration, and the research direction has focused on various directions such as the level of business operations, corporate investment and financing, and accounting decisions. Large customers can improve the performance of enterprises[2] and indirectly reduce the cost of equity capital in a given market environment[3]; however, customer concentration above a certain level can increase the liquidity risk of enterprises[4] and lead to an increase in the cost of debt[5] which can exacerbate financing constraints and harm the operating performance of enterprises[6], both of which have a negative impact on the level of technological innovation of enterprises[7].

Based on this, this paper focuses on answering the following questions: (1) Does and how does customer concentration affect firms' innovation efficiency? (2) Does the mechanism of the effect of customer concentration differ depending on the nature of enterprise property rights and the level of high technology? Using the data related to A-share listed companies in China from 2005-2021 as the initial research sample, this paper empirically examines how the sales of large corporate customers affect corporate innovation efficiency, and examines the strength of the signaling mechanism of customer concentration on innovation efficiency from the perspective of whether they are state-owned enterprises or high-tech enterprises, respectively, and further focuses on the different innovation. The results of this paper show that the customer concentration of a firm can influence the efficiency of innovation. The results of this paper show that the higher the concentration of customers, the lower the innovation efficiency of enterprises, and this relationship is more significant in state-owned enterprises and high-tech enterprises; the results of the robustness tests conducted by increasing the weight of invention patents in the dependent variable and adding company shareholding to the independent variables respectively reaffirm the results of this paper. This paper contributes to the relevance of the following two points: (1) Few existing studies have focused on the influence of customer concentration and corporate innovation efficiency, and the literature has explored the influence mechanism of customer concentration in general, this paper investigates in depth the influence of customer relationship on the input-output ratio of corporate innovation, and the findings of the study help to further provide different perspectives on the influencing factors of customer concentration, and also on the study of corporate innovation efficiency. Expanding the theory (2) This paper does an effective treatment on the assessment of enterprise innovation efficiency, and measures the input-output ratio of enterprises in a weighted way with different methods, and digs deeper into the differences in the assessment methods of enterprise innovation efficiency due to the distinction of the types of R&D results, and the differences in the degree of influence due to the different nature and management mechanisms of enterprises, thus helping to deepen the understanding of innovation efficiency and its influencing factors.

## **2. Literature Review and Research Hypothesis**

### **2.1. Customer Concentration and Firm Innovation Efficiency**

Innovation efficiency represents the proportional effect of innovation input and output of an enterprise. When the innovation output of an enterprise is greater than the innovation input, the innovation efficiency is higher. Innovation efficiency is influenced by the internal and external environment, human resources and management status of managers. A high concentration of customers helps to form stable and reliable customer relationships, while making it more likely for firms to obtain more valuable information from key customers and increase proprietary investments[8]-[9]. Customer relationships are closely linked to the innovation efficiency of a company, and when a company increases customer concentration, the company's technology operators can create factors that are detrimental to improving

innovation efficiency due to reduced access to information sources and incomplete information awareness. It is necessary for companies to control customer concentration within a certain range and make a trade-off between improving performance and enhancing innovation efficiency.

Customer concentration refers to the extent to which a firm's product sales are concentrated in a few large customers[10]. Some studies suggest that customer concentration promotes technological innovation of firms, and higher customer concentration means that both parties work closely together to promote the exchange of service information, market demand, and technological experience[11], and some studies indicate that firms' R&D aims to improve the quality of their own products to meet diversified customer needs[12], and it is important to keep abreast of diversified customer needs, and when products are sold centrally, demand diversification decreases and firms will reduce their investment in research and corresponding R&D on customers' needs. In addition, the unique market position formed by technological innovation and the satisfaction of customer needs will promote companies to cooperate with more customers, and therefore tend to reduce the dependence on large customers[13]. According to resource-based theory, enterprises have different resources, which can be transformed into different capabilities to improve competitiveness for enterprises[14], innovation efficiency is an important indicator to show the competitiveness of enterprises, innovation requires pre-preparation of different resource information integration to form new output, if customer concentration is too high, it will reduce the resource channel and affect the transformation efficiency at the same time; in addition, the risks of enterprises with high customer concentration include their own business risks and the risks faced by customers, which largely increase the business risks[15], and the R&D risks increase subsequently, all of which are not conducive to the improvement of enterprise innovation efficiency.

Based on the above analysis, the following hypotheses are proposed in this paper.

**H1: Other things being equal, customer concentration is negatively related to a firm's innovation efficiency.**

## **2.2. The Influence of the Nature of Property Rights and the Level of High-Tech Enterprise**

Enterprises with different property rights have different requirements for innovation efficiency. State-owned enterprises have stronger operational stability and lower tolerance for uncertainty brought by innovation. Customer concentration has a greater contribution to operational stability[16], so increasing customer concentration in state-owned enterprises will further reduce uncertainty and thus more innovation efficiency all the time; in contrast, private enterprises develop faster and face more frequent uncertainty brought by the environment and faster renewal among enterprises. The innovation function is essential for private enterprises, and while relying on large customers, customers and managers still prefer to exchange and cooperate to find innovative ideas and development opportunities, so the inhibiting effect of high customer concentration on innovation efficiency is relatively insignificant compared to state-owned enterprises.

In addition, the firm's technology level also has a direct effect on the mechanisms that influence innovation efficiency. High-tech firms have a higher level of innovation than non-high-tech firms, yet increasing customer dependence reduces innovation efficiency even more. The reason is that high-tech enterprises concentrate on R&D, and the scale and quality of R&D departments are high, compared with the R&D part of ordinary enterprises, which is not outstanding. This is not conducive to risk diversification and transfer.

Therefore, the following hypothesis is proposed in this paper.

**H2: Other things being equal, customer concentration in SOEs has a stronger inhibiting effect on innovation efficiency.**

**H3: Other things being equal, customer concentration in high-tech firms has a stronger inhibiting effect on innovation efficiency.**

### 3. Study Design

#### 3.1. Sample Selection and Data Sources

This paper focuses on the influence of customer concentration on the innovation efficiency of enterprises, and the data related to providing customer concentration of Chinese A-share listed companies from 2005-2021 are selected as the initial sample, and then the following treatments are carried out according to the research topic: (1) this paper removes the companies with ST and \*ST in the current year as well as financial and insurance listed companies; (2) eliminates the sample of companies with serious missing (2) 17,604 sample observations were obtained after eliminating the sample of companies with serious missing data; (3) all continuous variables were processed with the tailing at the upper and lower 1% level to finally obtain the research sample required for this paper. The patent data used in this paper were collected manually through the website of the State Intellectual Property Office, and the rest of the data were obtained from the China Economic and Financial Research Database (CSMAR) and the Wind database.

#### 3.2. Variable Selection and Measurement

##### 1.Explained variables

Corporate Innovation Efficiency (*InnoEff1*). The ratio of the natural logarithm of total patent applications plus one to the natural logarithm of R&D expenditures plus one is used to measure the innovation efficiency of enterprises. In addition, for the robustness check of the findings, the ratio of the natural logarithm of the sum of invention patents, utility model patents and design patents according to the weight of 3:2:1 and the ratio of the natural logarithm of the sum of R&D expenditures plus one is used to measure it.

**Table 1.** Definition and meaning of variables

Variable Type	Variable Name	Variable Symbols	Variable Definition
Explained variables	Enterprise innovation efficiency	<i>InnoEff1</i>	$\ln(\text{total number of invention, utility model and design patent applications} + 1) / \ln(1 + \text{R\&D expenditure})$
		<i>InnoEff2</i>	$\ln(\text{total number of invention, utility model and design patent applications} + 1) / \ln(1 + \text{R\&D expenditure})$ The weights of the 3 types of patents are taken according to 3:2:1
Explanatory variables	Customer Concentration	<i>HHI</i>	The sum of the sales of the company's top five customers as a percentage of total sales
Control variables	Total net asset margin	<i>ROA</i>	Net Profit / Total Assets
	Tobin's Q value	<i>TobinQ</i>	Company Growth
	Board Size	<i>lnboard</i>	Board size is taken as the natural logarithm
	Company Age	<i>estage</i>	Number of years of company establishment
	Top 10 shareholders' shareholdings	<i>Top10</i>	The sum of the shareholding ratio of the top ten largest shareholders of the company
	Year	<i>Year</i>	Dummy variables
	Industry	<i>Ind</i>	Dummy variables

2. Explanatory variables

Customer Concentration (*HHI*). According to most of the existing literature[17]-[22] practices, the sum of the sales of the top five customers as a percentage of the sales revenue of the listed company is used to measure the customer concentration of the company.

3. Control variables

Synthesizing the existing literature, this paper selects total net asset margin (*ROA*), *Tobin's Q* (*TobinQ*), board size (*Inboard*), firm age (*estage*), and top 10 shareholders' shareholdings (*Top10*) as control variables for this paper's model. In addition, dummy variables such as year (*Year*) and industry (*Ind*) are also set in this paper to control for the effects of annual trends and disparities between industries. The specific variable descriptions are shown in Table 1.

3.3. Model Setting

Hypothesis 1, which reflects the effect of customer concentration on the innovation efficiency of firms, is tested by model (1).

$$InnoEff = \alpha_0 + \alpha_1 HHI + \Sigma Control + Year + Ind + \varepsilon$$

Among them, *InnoEff* is the explanatory variable, *HHI* is the explanatory variable, and *Control* is the control variable of this paper, which mainly includes total net asset margin (*ROA*), *Tobin's Q* (*TobinQ*), board size (*Inboard*), firm age (*estage*), and top 10 shareholders' shareholdings (*Top10*), etc., *Year* and *Ind* are the year fixed effects and industry fixed effects controlled for in this paper.

4. Empirical Analysis

4.1. Descriptive Statistics

Table 2 presents the descriptive statistics of the main variables. From the information in Table 2, it can be found that the sample of this paper contains 17,604 observations. The innovation efficiency of the sample companies (*InnoEff1*) shows some differences, while the median is larger than the mean, indicating that more than half of the listed companies have innovation efficiency higher than the sample average; the mean value of customer concentration (*HHI*) is 0.321, the standard deviation is 0.217, the minimum value is 0.021, and the maximum value is 0.951, indicating that the sample companies' customer concentration level of the sample companies is more different.

Table 2. Results of descriptive statistics of variables

Variables	Number of observations	Average value	Standard deviation	Median	Minimum value	Maximum value
HHI	17604	0.321	0.217	0.266	0.021	0.951
InnoEff1	17604	0.156	0.083	0.166	0.000	0.327
ROA	17604	0.040	0.063	0.040	-0.277	0.195
TobinQ	17604	1.960	0.919	2.079	0.000	3.296
Inboard	17604	2.115	0.197	2.197	1.609	2.708
estage	17604	2.890	0.312	2.944	1.946	3.497
Top 10	17604	59.567	14.714	60.795	24.711	90.428

Note: \*\*\*, \*\*, and \* indicate significant at the 1%, 5%, and 10% levels, respectively.



## 4.2. Multiple Regression Analysis

Table 3 exhibits the multiple regression results. The first to third columns of Table 3 demonstrate the relationship between customer concentration and firm innovation efficiency, respectively. The regression results show that the regression coefficients for customer concentration are -0.018, -0.011, and -0.043, indicating that they are significantly negative at the 1% level, which is consistent with the theoretical and expected hypotheses. When controlling only for customer concentration, adding control variables, and changing the number of observations, the lower the total number of invention, utility model, and design patent applications of firms relative to R&D expenditures in numerical terms. Combining the above regression results, hypothesis 1 is verified, i.e., customer concentration is significantly and negatively related to firms' innovation efficiency.  $r^2$  in columns 1, 2, and 3 shows an increasing trend, indicating that the design idea is consistent with the stepwise regression method.

**Table 3.** Regression results of the base model

	(1)	(2)	(3)
<i>HHI</i>	-0.018*** (-6.246)	-0.011*** (-3.870)	-0.043*** (-13.314)
<i>Controls</i>	YES	YES	YES
<i>constant</i>	0.162*** (141.953)	0.101*** (10.602)	0.005 (0.463)
<i>Year&amp;Ind</i>	NO	NO	YES
<i>N</i>	17604	17604	14347
<i>Adj.R<sup>2</sup></i>	0.002	0.018	0.205

Note: \*\*\*, \*\*, and \* indicate significant at the 1%, 5%, and 10% levels, respectively, with t-values in parentheses.

## 4.3. Heterogeneity Analysis

### 1. Distinguish the nature of different property rights

Customer concentration has a stronger inhibitory effect on corporate innovation efficiency in state-owned enterprises. When executives have greater ownership rights, they will try to exert their professional and leadership abilities to effectively control R&D costs and R&D risks and effectively improve innovation efficiency[24]. In contrast, in state-owned enterprises, the influence of ownership rights control is smaller and unstable due to the prevalence of rotation system, resulting in insufficient driving force for corporate innovation when the chairman holds an executive position; and the role of state-owned enterprises lies more in maintaining stability rather than innovation. In SOEs, managers do not pay much attention to the degree of innovation in the firm because the property rights do not belong to the managers and the managers do not have a high degree of decision-making about the firm's innovation. In this paper, we use dummy variables to measure the nature of property rights, taking 1 for state-owned enterprises and 0 for non-state-owned enterprises.

In order to verify the effect of property rights nature on customer concentration and enterprise innovation efficiency, this paper refers to the research method of Liu, B. et al. (2020)[25], and performs group regressions based on property rights nature. The results of model (1) and model (2) tests in Table 5 show that customer concentration (*HHI*) is negatively significant at

the 1% level in both the non-SOE and SOE sample groups, but in the SOE sample group, the coefficient of customer concentration (*HHI*) is higher in the SOE sample group compared to the non-SOE sample group, indicating that the inhibitory effect of customer concentration on firms' innovation efficiency is more pronounced in SOEs.

## 2. Distinguish the level of high-tech enterprises

In high-tech industries, customer concentration has a stronger inhibiting effect on innovation efficiency. Traditional customer relationships are more focused on maintaining stability, and excessive reliance on large customers may lead to a certain level of risk taking and also cause a lack of independence[13]. In high-tech enterprises, the degree of innovation and independence is higher, and the high proportion of R&D business lines requires more independent risk-taking, and the risk of innovation function is not diversified in high-tech enterprises compared with other enterprises with rich business lines, when customer concentration increases, it is easy to inhibit the innovation efficiency of enterprises to a greater extent.

In this paper, we adopt the method of introducing the dummy variable of whether it is a high-tech enterprise, the median of the degree of the sample above the high-tech level is 1, and the median of the degree below the high-tech level is 0. The sample of enterprises is divided into high-tech enterprises and non-high-tech enterprises, and the regression results of model (3) and model (4) in Table 4 show that in the sample group of high-tech enterprises and the sample group of non-high-tech enterprises, the customer concentration (*HHI*) are negatively significant at the 1% level. This indicates that the inhibitory effect of customer concentration on innovation efficiency is more pronounced when the firm is a high-tech firm compared to a non-high-tech firm.

**Table 4.** Heterogeneity analysis (distinguishing different property rights nature and enterprise high-tech level)

Explanatory variables	Explained variable (InnoEff1)			
	State-owned enterprises	Non-State Owned Enterprises	High-tech Enterprise	Non-high-tech enterprises
	Model(1)	Model(2)	Models(3)	Models(4)
HHI	-0.051*** (-8.737)	-0.043*** (-10.253)	-0.042*** (-10.717)	-0.036*** (-6.607)
Controls	YES	YES	YES	YES
constant	-0.002 (-0.095)	0.057*** (3.534)	0.003 (0.185)	-0.015 (-0.750)
Year& Ind	YES	YES	YES	YES
N	3959	9105	9115	5232
adj.R2	0.266	0.180	0.125	0.189

Note: \*\*\*, \*\*, and \* indicate significant at the 1%, 5%, and 10% levels, respectively, with t-values in parentheses.

## 4.4. Robustness Test

### 1. replace the explanatory variables.

In order to ensure the robustness of the research results, this paper refers to the research measurement of the Research Group on China Innovation Index (2020) of the Department of Social Science and Culture of the National Bureau of Statistics, and considers that invention patents have the highest technical content among the three types of patents, which can reflect the level of patents and the market value and competitiveness of R&D achievements, and can indirectly reflect the innovation efficiency of enterprises. By adjusting the definition of the

explanatory variables, the total number of applications for invention patents, utility models and design patents, of which the weights of the three types of patents are taken according to 3:2:1, the same arithmetic calculation as the previous explanatory variables is carried out to obtain an alternative indicator to measure the innovation efficiency of enterprises, named *Innoeff2*, which in turn is higher than the original indicator in reflecting the degree of patent quality, and is regressed again, and the results are shown in Table 5. The results are shown in Table 5. The test results of model (1) and model (2) in Table 5 show that customer concentration (*HHI*) is significant at the 1% level, and after adding control variables, customer concentration (*HHI*) is still significant at the 1% level. Table 5 model (3) on the basis of model (1) and model (2), after controlling for year and industry again, the regression coefficient of customer concentration (*HHI*) is -0.045, which is negatively significant at the 1% level, which again verifies hypothesis H1 and also proves that the results of this paper are more robust.

**Table 5.** Replacement of explanatory variables

Explanatory variables	Explained variable innoeff2		
	Model (1)	Models (2)	Models (3)
HHI	-0.016*** (-4.883)	-0.009*** (-2.703)	-0.045*** (-12.037)
Controls	YES	YES	YES
constant	0.200*** (139.243)	0.137*** (12.598)	0.030** (2.170)
Year&Ind	NO	NO	YES
N	17604	17604	14347
adj.R2	0.001	0.015	0.194

Note: \*\*\*, \*\*, and \* indicate significant at the 1%, 5%, and 10% levels, respectively, with t-values in parentheses.

**2. Adjustment of control variables**

**Table 6.** Adjustment of control variables

Explanatory variables	The explanatory variable InnoEff1		
	Model (1)	Models (2)	Models (3)
<i>HHI</i>	-0.018*** (-6.246)	-0.011*** (-3.568)	-0.043*** (-12.291)
<i>Top10R</i>		-0.003** (-2.277)	-0.003** (-2.146)
<i>excushare</i>		0.005 (1.181)	-0.001 (-0.162)
<i>Controls</i>	YES	YES	YES
<i>constant</i>	0.162*** (141.953)	0.101*** (9.786)	0.012 (0.918)
<i>Year&amp; Ind</i>	NO	NO	YES
<i>N</i>	17604	17102	13974
<i>adj.R2</i>	0.002	0.018	0.205

Note: \*\*\*, \*\*, and \* indicate significant at the 1%, 5%, and 10% levels, respectively, with t-values in parentheses.



To further investigate the influence of more corporate stakeholders on the efficiency of corporate innovation, the control variables were adjusted to include new control variables measuring the top 10 shareholders' connectedness and executive shareholding, respectively, denoted by Top10R and *excushare*, and regression analysis was conducted, and the results are shown in Table 6. The test results of model (1) and model (2) in Table 6 show that when the two new control variables, customer concentration (*HHI*) is significant at the 1% level. The regression coefficient of customer concentration (*HHI*) in model (3) is -0.043, which is negative and significant at the 1% level after controlling for year and industry again based on model (1) and model (2). Combining the regression results of the three models, it can be found that, in terms of significance level as well as regression coefficients, it is the same as the multiple regression model in Table 3 above, which proves that the results of this paper are more robust based on the verification of hypothesis H1.

### 3. Reduction of the sample.

In this paper, after eliminating the relevant data samples from 2012 and earlier, a total of 16705 observations were obtained; after controlling for year and industry, 13448 observations were obtained for regression analysis. The results are shown in Table 7, where the test results of model (1) and model (2) show that customer concentration (*HHI*) is significant at the 1% level when the sample is reduced. Table 7 Model (3), based on model (1) and model (2), after controlling for year and industry again, the regression coefficient of customer concentration (*HHI*) is -0.043, which is negatively significant at the 1% level. The robustness of the results of this paper is again verified.

**Table 7. Reduced sample**

Explanatory variables	The explanatory variable <i>InnoEff1</i>		
	Model (1)	Models (2)	Models (3)
<i>HHI</i>	-0.018*** (-5.907)	-0.011*** (-3.510)	-0.043*** (-12.830)
<i>Controls</i>	YES	YES	YES
<i>constant</i>	0.162*** (139.243)	0.106*** (10.746)	0.003 (0.245)
<i>Year&amp; Ind</i>	NO	NO	YES
<i>N</i>	16705	16705	13448
<i>adj.R2</i>	0.002	0.020	0.204

Note: \*\*\*, \*\*, and \* indicate significant at the 1%, 5%, and 10% levels, respectively, with t-values in parentheses.

## 5. Conclusion and Insight

This paper examines the relationship between customer concentration and corporate innovation efficiency using data related to Chinese A-share listed companies from 2005-2021 as a sample. It is found that: (1) Firms with higher customer concentration tend to have lower innovation efficiency. (2) The nature of a firm's property rights affects the relationship between the firm's customer concentration and innovation efficiency. In state-owned enterprises, the role in the field of innovation development is not obvious due to the main function of the enterprise, and customer concentration has a greater inhibitory effect on the innovation efficiency of the enterprise. (3) The level of enterprise high technology also has an influential role on the relationship between customer concentration and innovation efficiency of

enterprises. In contrast, the inhibitory effect of customer concentration on innovation efficiency is more pronounced in high-tech enterprises, and customer concentration leads to a certain degree to a decrease in the independence of the enterprise and an increase in the risk of the enterprise, which in turn indirectly affects the increase in innovation efficiency.

The findings of this paper confirm the negative effect of customer concentration on the efficiency of corporate innovation, and also find the effect of the nature of property rights and high-tech level on the relationship between the two. Based on this, the theoretical insights of this paper are: (1) The existing studies focus on the impact of customer concentration on innovation investment or innovation performance of enterprises, while this paper combines the two, reveals the negative impact of close customer relationship from the perspective of enterprise innovation function, and enriches and expands the research on customer concentration on enterprise innovation efficiency decision. (2) This paper has a certain enriching effect on the research of enterprise innovation, combining the property rights and technology factors of innovation, and comprehensively revealing the collinearity between customer concentration, property rights, high-tech level and enterprise innovation efficiency, bringing insights on the mechanism of the influence of customer concentration on enterprise innovation efficiency.

The theoretical analysis and empirical basis of this paper have the following policy implications: For enterprises: (1) In order to efficiently perform the innovation function in the process of enhancing innovation, enterprises must consider the level of customer selection and management, appropriately expand the scope of target objects instead of overly concentrated, and under the construction of a relatively decentralized customer system, enterprises are thus able to make diverse decisions, enhance independence, and better manage risks. With a relatively decentralized customer system, companies are able to make diverse decisions, increase their autonomy, and manage risks better, thus devoting their efforts more effectively to improving innovation efficiency. (2) Compared with non-state-owned enterprises, state-owned enterprises need to pay attention to the role of different talents and promote the diversity of their functions in the process of innovation decision making, and at the same time, they can also appropriately increase the rights of executives in the enterprise and let them participate in the internal decision making and management of the company to avoid excessive concentration of power; for high-tech enterprises, although their own technological innovation level is higher, they also need to deeply understand the efficiency level of their own innovation inputs and outputs. For high-tech enterprises, although their own technological innovation level is higher, they should also be deeply aware of the efficiency level of their own innovation input and output, pay attention to avoid relying on individual talents to participate in innovation development decisions, and need to listen to multiple opinions and have more independent and innovative decision-making methods, and not stick to the traditional customer maintenance model because of the inherent nature of the enterprise, and more often than not, customers can be appropriately decentralized.

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